UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,304	07/14/2006	Yoshito Ishii	1204.46402X00	2523

20457 7590 05/28/2010

ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-3873

EXAMINER	
CANTELMO, GREGG	
ART UNIT	**PAPER NUMBER**
1795	

MAIL DATE	DELIVERY MODE
05/28/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/586,304	ISHII ET AL.	
	Examiner	Art Unit	
	Gregg Cantelmo	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *6-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6,7,9,13,16 and 21-26* is/are rejected.

7)☒ Claim(s) *8,10-12,14,15 and 17-20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/19/10*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. In response to the amendment received February 12, 2010:

Claims 6-26 are pending;

The prior art rejection to Shoji stands;

The remaining prior art rejections are withdrawn.

Information Disclosure Statement

2. The information disclosure statement filed April 19, 2010 has been placed in the application file and the information referred to therein has been considered as to the merits.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 6, 7, 9, 13, 16, 21, 22, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-283844 (Shoji) in view of U.S. Patent No. 6,344,296 (Ishii-296).

Shoji discloses a negative electrode including a graphite material and a binder (abstract). The graphite material includes particles having a mean particle diameter of 20 microns (para. 15), a crystallite size Lc(002) in a C-axis direction of 780 Angstroms (para. 15), and where the ratio of (002)/(110) is at most 500 (see para. 15 as applied to claim 6).

The density is 1.5-1.9 g/cm^3 (prior art claim 3 as applied to claim 7).

The graphite powder is ground and thus mechanically modified (para. 15 as applied to claim 9).

Shoji teaches further of a lithium secondary battery comprising a negative electrode as recited in claim 6 and a positive electrode containing lithium compound (as applied to claim 13).

The lithium compound can include nickel (para. 18 as applied to claim 16).

The ratio of (002)/(110) is 300 (para. 24 and examples 5-8 as applied to claims 21, 22, 24 and 25).

Shoji does not teach of the graphite having an aspect ratio of 5 or less or a BET of 8 m^2/g or less.

Regarding the claimed aspect ratio:

Ishi-296 teaches of controlling the aspect ratio of graphite particles to 5 or less. The aspect ratio is preferably in the range of from 1.2 to 5. When the aspect ratio is smaller than 1.2, contact area between particles decreases, due to which conductivity decreases. For the same reason as above, a more preferable range of aspect ratio is 1.3 or more (col. 4, ll. 61-65).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Shoji by controlling the aspect ratio of graphite particles to 5 or less as taught by Ishii-296 since it would have enhanced the conductivity of the graphite material and improve the charge/discharge characteristics.

Regarding the claimed BET:

The third graphite particle of this invention is a graphite particle having a specific surface area of 8 m^2/g or less. The specific area is preferably 5 m^2/g or less, more preferably 1.5-5 m^2/g, and further preferably 2-5 m^2/g. By using such a graphite particle as a negative electrode, the rapid charge-discharge characteristics and cycle characteristics of the lithium secondary battery obtained therefrom can be improved, and the irreversible capacity in the first cycle can be decreased. If the specific surface area is greater than 8 m^2/g, the irreversible capacity of the first cycle of the lithium secondary battery obtained therefrom is high and the energy density is low, and further there is a problem that the preparation of negative electrode requires to use a large quantity of binder. On the other hand, if, the specific surface area is smaller than 1.5 m^2/g, the rapid charge-discharge characteristics and cycle characteristics of the lithium secondary battery obtained therefrom tend to be deteriorated. The specific surface area can be measured by known methods such as BET method (nitrogen gas adsorption method) or the like. (col. 5, ll. 14-33).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Shoji by controlling the BET to be 8 m^2/g or less as taught by Ishii-296 since it would have improved the rapid charge-discharge characteristics and cycle characteristics of the lithium secondary battery obtained and would have decreased the irreversible capacity in the first cycle.

Response to Arguments

4. Applicant's arguments filed February 12, 2010 have been fully considered but they are not persuasive.

Applicant argues that the disclosure of Ishii (U.S. Patent No. 6,344,296) relied upon in the rejection suffers the same deficiencies as Ishii '365.

This argument is not persuasive since Ishii is not relied upon to teach the diffraction ratio. Rather the diffraction ratio is taught by Shoji.

Applicant further argues that Shoji teaches of a diffraction intensity ratio (002)/(110) for the graphite particles and not the film.

This argument is not persuasive.

First, the graphite particles of Shoji exhibit the same requisite diffraction ratio intensity.

Second the composition Shoji uses the same graphite type of material and similar binder materials. For example, in para. 16, the mixture is the particular graphite, SBR and CMC at a ratio of 100:3:2. Hence the layer has an overwhelming majority of graphite in the film and the film would still expectedly exhibit the same diffraction ratio intensity as claimed.

Third, the binder materials of Shoji are similar, if not identical to that of the instant application and thus are expected to materially impact the film in the same manner. Thus the film composition of Shoji, having the same graphite material and binders, as discussed above, and as taught by the instant application that one of ordinary skill in the art would expect that the film of Shoji would exhibit the same diffraction ratio intensity.

Therefore this rejection stands.

Claim Rejections - 35 USC § 103

5. Claims 23 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-283844 (Shoji) in view of U.S. Patent No. 6,344,296 (Ishii-296) as applied to claim 1 and in further view of U.S. Patent No. 6,139,990 (Kubota).

Shoji does not teach of the ratio of (002)/(110) being in a range of 50-200 (claims 23 and 26).

Shoji does teach of the intensity being 1000 or less and teaches of specific examples at 300 (abstract and para. 24, Examples 5-8).

Kubota teaches of diffraction intensity ratio (110)/(002) which is at least 0.005 (abstract). This is equivalent to a diffraction intensity ration of (002)/(110) which is the inverse of 0.0050 or less. In other words the teachings of Kubota teaching of the (110)/(002) ratio to be at least 0.0050 also teaches that the inverse ratio of (002)/(110) that is 200 or less (as applied to claim 1). The (110)/(002) ratios of Table 1 for examples 1-5 are as follows: Ex. 1 (0.0087), Ex. 2 (0.0150), Ex 3 (0.0072), Ex. 4 (0.0110) and Ex. 5 (0.0092). The inverse ratio, (002)/(110) would then be as follows: Ex. 1 (114.9), Ex. 2 (67), Ex 3 (138.9), Ex. 4 (90.9) and Ex. 5 (109). These specific embodiments fall within the ranges of claims 22-26.

The motivation for controlling the (110)/(002) ratio (thus also the (002)/(110) ratio) as taught by Kubota is that it provides for an active material having superior capacity ratios and discharge current.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Shoji by controlling the (110)/(002) ratio (thus also the (002)/(110) ratio) as taught by Kubota since it would

have provided for an active material having superior capacity ratios and discharge current.

Allowable Subject Matter

6. Claims 10, 14, 17 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: none of the prior art of record are held to reasonably teach, suggest or render obvious the method of claim 10 and the product produced by the method of claim 10.

7. Claims 8, 11, 12, 15, 18 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: none of the prior art of record are held to reasonably teach, suggest or render obvious the graphite powder being secondary powder having the properties of claim 6, including an aspect ratio (AR) of at most 5 wherein the secondary powder is a plurality of flat primary powders aggregated or bonded so as to be non-parallel in orientation and individual flat primary powders have a size in the range of 1-100 microns and an AR of 100 or less.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:30-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregg Cantelmo/
Primary Examiner, Art Unit 1795